



Africa RISING in Ghana

Creating Sustainable Systems for Agriculture



Country brief - March 2019



Outcomes

Technologies validated

12



Farmers worked with to validate technologies

13,500



Long-term trainings **6 PhD's, 9 MScs & 1 Bsc**



Number of development partnerships

12



Research-in-development scope

1. Cropping systems

- Agronomic management and crop varieties

2. Livestock systems

- Feeding
- Housing
- Health
- Breeds
- Manure management
- Integrated crop-livestock management

3. Natural resource management [NRM]

- Nutrient cycling
- Soil & water management
- Fertilizers

4. Human condition

- Nutrition
- Food security/ quality/ safety

5. Mechanization

- Postharvest handling
- Field preparation
- Irrigation

*Appropriate technologies are integrated within and across the components above.



Technology delivery

Sustainable intensification domains

- Productivity
- Environment
- Economic
- Human condition
- Social

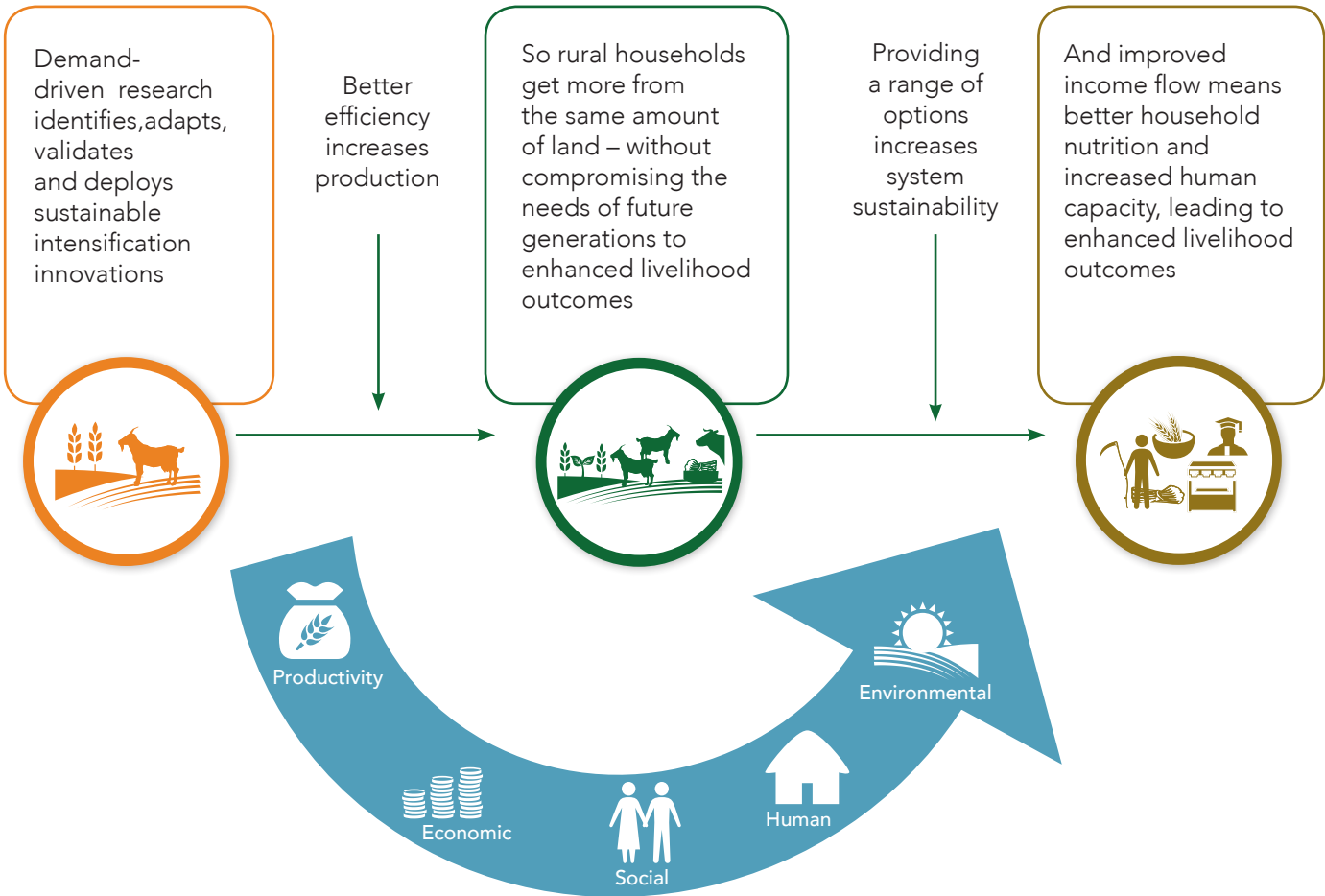
Collaboration

- CGIAR centers
- NARS
- Farmers
- Private sector
- Universities
- Extension services
- Government agencies

Capacity building

- Short term training
- Post-graduate training [MSc, PhD]
- Exchange visits
- Farmer field days

Africa RISING's theory of change



Multiple sustainable intensification domains in an enabling policy environment result in long-term equity and viability



1 Cropping systems

► Agronomic management and crop varieties

- **Maize-cowpea intercrops:** The effect of different growth levels of cowpea living mulch and level of maize maturity in both farmers' fields and community technology parks have demonstrated that planting early maturing maize (Omankwa) with cowpea as living mulch at 1 week after planting maize reduces weed infestation by 40% and increases maize yields by 36%. Reduced labor demands will allow for easier adoption and more time for alternative livelihood options.
- **Optimal crop spacing:** Optimal spacing of groundnut varieties (specifically Samnut 23) at a spacing of 30 cm × 15 cm has demonstrated that grain and haulm yields are increased by 22%. The increased yields will potentially provide income avenues for food, health and education.
- **Maize leaf stripping:** The stripping of leaves of the medium maturity maize variety (Obatanpa) at 50% silking has been shown to increase livestock feed by 27% with no penalty or decrease in maize yield experienced. The increased feed yields provide diversified diets of animal protein while improving food security.

► Irrigation

- The use of the Wetting Front Detector as irrigation-scheduling tool improved irrigation water-use efficiency by 35% and saved irrigation water by 16% in Nyangua and Tekuru communities (Upper East region of Ghana).

► Soil and water management

- The use of appropriate soil and water conservation measures, e.g., tied ridges and contour planting and ridging has demonstrated increased soil moisture storage by 20% and increased maize yields by 15%.
- Cowpea living mulch reduced direct evaporation of soil moisture by 25%, reduced weed infestation by 65%, and reduced soil losses by 45% as a groundcover. The reduced labor demands from less weeding allow for easier adoption and more time for alternative livelihood options.
- Evidence on the probability and length of dry spells was generated at different growth stages of maize, millet and sorghum in the Upper East Region of Ghana. This offers opportunity to identify appropriate soil and water management strategies for increasing resilience in the region.

► Fertilizers

- Planting of early maturing maize (Omankwa) with nitrogen fertilizers administered at a rate of 90 kg/ha increased both maize and stover yields.



2 Livestock systems

► Feeding

- Farmers have changed behavior through adapting feed rations to their own conditions; this contributes to sustainability.
- Improved feeding in Northern Ghana has increased weight gains, increased manure production, and reduced mortality in the target communities, e.g., Tibali in the Northern Region.
- In Ghana improved feed rations have increased reproduction rates, reduced mortality, and increased household (HH) income. Diversified income sources increase household resilience.
- **Housing**
 - Improved housing in Northern Ghana has reduced theft, and improved animal health and feeding.
- **Health**
 - In collaboration with local health workers, regular vaccination has reduced mortality and helped provide reassurance for improved livestock management.
- **Breeds**
 - Africa RISING and farming communities are currently exploring options for improved breeds of small ruminants for farmers through linking them to appropriate veterinary providers.



4 Human condition

► Nutrition

- Through promotion of vegetable growing and nutritional education, smallholder households in target communities have diversified diets (> 3 food types) that diets provide food and nutritional security in target communities.
- **Food security/quality/safety**
 - Increased vegetable growing offers higher household consumption of quality food and potentially higher income benefits that proceed from sales.



5 Mechanization

► Postharvest handling

- Fuel-powered maize shelling machines are very popular with 90% acceptability. The maize shelling machines have substantial labor-saving gains. Men noted it takes them 10 hours to shell one bag and women reported that it would take them about 1 week if they were doing it manually as a sole activity. The reduced labor demands will create service provision among farmers and allow for alternative livelihood options.
- **Field preparation**
 - The use of appropriate tillage management practices, e.g., tied rides and contour planting and ridging increased soil moisture storage by 20% and increased maize yields by 15%.



3 Natural resource management (NRM)

► Nutrient cycling

- The use of crop residues from leaf stripping, groundnut haulms, and cowpea living mulch helps to increase livestock productivity. The use of manure produced from livestock as organic amendments increases soil moisture storage capacity and soil fertility.



Partners:



The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative. Through action research and development partnerships, Africa RISING is creating opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base. The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.

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